

IN THE CLAIMS

1. (canceled)

2. (canceled)

3. (canceled)

4. (canceled)

5. (canceled)

6. (canceled)

7. (canceled)

8. (canceled)

9. (canceled)

10. (canceled)

11. (canceled)

12. (canceled)

13. (currently amended) A method of calculating the concentration of a first predetermined substance in the blood of a mammal comprising passing said blood through one side of a semipermeable membrane in a dialyser and passing a dialysis fluid on the other side of said semipermeable membrane in said dialyser to provide a dialysate, measuring the concentration of said first predetermined substance in said dialysate, introducing a disturbance in said dialyser by changing the concentration of a second predetermined substance in said dialysis fluid, wherein said first and second predetermined substances are not the same, measuring the change in the concentration of said second predetermined substance in said dialysate, calculating the effective dialysance of said dialyser based on said disturbance, and calculating the concentration of said first predetermined substance in said blood based upon said effective dialysance.

14. (currently amended) The method of claim 13 including determining the flow rate of said dialysate, and

wherein said calculating of said concentration of said first predetermined substance in said blood comprises multiplying said measured concentration of said first predetermined substance in said dialysate by said flow rate of said dialysate to provide a product and dividing said product by said effective dialysance.

15. (currently amended) The method of claim 14 wherein said measuring of said concentration of said first predetermined substance in said dialysate is utilized to obtain a curve of said concentration over time, and including calculating the initial mass of said first predetermined substance in a body of said mammal, calculating the initial concentration of said first predetermined substance in said blood, and calculating the distribution volume of said first predetermined substance in said body by dividing said initial mass by said initial concentration of said first predetermined substance in said blood.

16. (canceled)

17. (currently amended) A method of calculating the concentration of a first predetermined substance in the blood of a mammal comprising passing said blood through one side of a semipermeable membrane in a dialyser and passing a dialysis fluid on the other side of said semipermeable membrane in said dialyser to provide a dialysate, determining the flow rate of said dialysate, measuring the concentration of said first predetermined substance in said dialysate, introducing a disturbance in said dialyser ~~The method of claim 13 including and wherein said introducing of said disturbance in said dialyser comprising~~ es adding a predetermined amount of a second

predetermined substance into said dialysis fluid, wherein said first and second predetermined substances are different,
~~measuring the concentration of said predetermined substance in said dialysate,~~ determining the amount of said second predetermined substance in said dialysate by multiplying said concentration of said second predetermined substance in said dialysate with said flow rate of said dialysate to obtain a product and integrating said product over time, and wherein said calculating of said effective dialysance comprises multiplying said flow rate of said dialysate with a fraction comprising 1 minus said amount of said second predetermined substance in said dialysate over said amount of said second predetermined substance in said dialysis fluid.

18. (currently amended) The method of claim ~~16~~ 13 wherein said second predetermined substance comprises a substance selected from the group consisting of sodium ions or,
a conductivity altering substance, ~~and urea.~~

19. (currently amended) The method of claim 17 wherein said ~~second~~ first predetermined substance comprises urea.

20. (currently amended) Apparatus for calculating the concentration of a first predetermined substance in the blood of a mammal comprising a dialyser including a semipermeable membrane, means for passing said blood over one side of said semipermeable membrane in said dialyser, means for passing a dialysis fluid over the other side of said semipermeable membrane in said dialyser to produce a dialysate, concentration measuring means for measuring the concentration of

said first predetermined substance in said dialysate, disturbance means for introducing a disturbance in said dialyser comprising means for changing the concentration of at least a second predetermined substance in said dialysis fluid, a measuring means for measuring the change in the concentration of said second predetermined substance in said dialysate, calculating means for calculating the effective dialysance of said dialyser based on said disturbance, and concentration calculating means for calculating the concentration of said first predetermined substance in said blood based on said effective dialysance, said first and second predetermined substances being different substances.

21. (currently amended) The apparatus of claim 20 including flow rate means for obtaining the flow rate of said dialysate, said concentration calculating means comprising means for multiplying said concentration of said first predetermined substance in said dialysate by said flow rate of said dialysate to provide a product, and dividing said product by said effective dialysance of said dialyser.

22. (currently amended) The apparatus of claim 21 wherein said concentration measuring means comprises means for measuring said concentration of said first predetermined substance in said dialysate to obtain a concentration curve, and including mass calculating means for calculating the initial mass of said first predetermined substance in said mammal, initial concentration calculating means for measuring the initial concentration of said first predetermined substance in said mammal, and distribution volume calculating means for

measuring the initial distribution volume of said first predetermined substance in said mammal.

23. (canceled)

24. (currently amended) Apparatus for calculating the concentration of a first predetermined substance in the blood of a mammal comprising a dialyser including a semipermeable membrane, means for passing said blood over one side of said semipermeable membrane in said dialyser, means for passing a dialysis fluid over the other side of said semipermeable membrane in said dialyser to produce a dialysate, concentration measuring means for measuring the concentration of said first predetermined substance in said dialysate, disturbance means for introducing a disturbance in said dialyser
~~The apparatus of claim 20 including flow rate means for measuring the flow rate of said dialysate, and wherein said disturbance means comprises~~ing means for introducing a predetermined amount of a second predetermined substance into said dialysis fluid, calculating means for calculating the effective dialysance of said dialyser based on said disturbance, and concentration calculating means for calculating the concentration of said first predetermined substance in said blood based on said effective dialysance, said first and second predetermined substances being different substances, said
concentration measuring means comprising means for measuring the concentration of said second predetermined substance in said dialysate, and including amount determining means for determining the amount of said second predetermined substance in said dialysate by multiplying said concentration of said second

predetermined substance in said dialysate with said flow rate of said dialysate to provide a product and integrating said product over time, and wherein said calculating means comprises means for multiplying said flow rate of said dialysate by a fraction comprising 1 minus said amount of said second predetermined substance in said dialysate over the concentration of said second predetermined substance in said dialysis fluid.

25. (currently amended) The apparatus of claim ~~23~~20 wherein said second predetermined substance comprises a substance selected from the group consisting of sodium ions,~~—or~~ a conductivity altering substance~~—and—urea~~.

26. (currently amended) The apparatus of claim 25 wherein said ~~second~~first predetermined substance comprises urea.